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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,452	04/15/2004	Yifeng Wu	200312575	8319

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EXAMINER

RILEY, MARCUS T

ART UNIT	PAPER NUMBER
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2625

NOTIFICATION DATE	DELIVERY MODE
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12/22/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/825,452	Applicant(s) WU ET AL.	
	Examiner MARCUS T. RILEY	Art Unit 2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/15/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. In view of the Appeal Brief filed on September 2, 2009 PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

***.

Response to Amendment

2. This office action is responsive to applicant's remarks received on September 02, 2009. Claims 1-39 remain pending.

Response to Arguments

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3. Applicant's arguments with respect to claims 1-39 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1-39** are rejected under 35 U.S.C. 103(a) as being unpatentable over Oyumi (US 7,301,677 B2 hereinafter, Oyumi '677) in combination with Pass et al (US 6,671,402 B1 hereinafter, Pass '402) as applied to claim 1, and further in view of Karidi et al. (US 6,185,335 B1 hereinafter, Karidi '335).

Regarding claim 1; Oyumi '677 discloses a printing control system, comprising

(Fig. 1, Printing Controls System, i.e. Fig. 1 includes Printers 301 & 302 and server 303):

a plurality of printing units (Printers 301 & 302);

an image source (Fig. 2 & 6, Image Controller 38) providing a print job comprising a plurality of images (i.e. Fig. 6 shows the image controller 38 within Fig. 2. The image forming section is intended to print the four mark images 111a to 111d. Column 9, lines 33-36);

and a system processing unit (Fig. 2, CPU in Controller 39 – Not Shown. Column 8, lines 13-27).

wherein the system processing unit is configured to receive the plurality of images in the print job from the image source (i.e. The controller 39 causes a CPU therein, not shown, to collectively control the formation of normal images and the formation of predetermined mark images performed through the image controller 38. Column 8, lines 13-27);

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calculate an image histogram (Fig. 9, Density Histogram) for each image in the print job (i.e. The detection controller 620 creates density histogram data indicative of density histograms for each mark image based on data acquired by reading each mark image. Column 10, lines 57-60);

Oyumi '677 does not expressly disclose determining a similarity of the images in the print job by comparing the calculated histograms; classify the images into at least a first and a second class based on the similarity of the histograms.

Pass '402 discloses determining a similarity of the images in the print job by comparing the calculated histograms (Fig. 9, Step 940 i.e. At Step, the joint histogram of the image that was selected then is compared with the index of joint features. An image includes calculating a posterized joint histogram. Column 10, lines 14-25 and Column 1, lines 45-48);

classify the images into at least a first and a second class based on the similarity of the histograms (i.e. An image may further include calculating a posterized joint histogram. Information reflecting more than one feature of the image may be extracted from the image. Extracted features may include classes such as color, edge density, texturedness, gradient magnitude, and rank. column 1, lines 45-52).

Oyumi '677 and Pass '402 are combinable because they are from same field of endeavor of image representation (Pass '402 at "Field of Invention").

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the printer system as taught by Oyumi '677 by adding determining a similarity of the images in the print job by comparing the calculated histograms and classifying the images into at least a first and a second class based on the similarity of the histograms as taught by Pass '402. The motivation for doing so would have been because it is advantageous to separate the images into categories for easy identification. Therefore, it would have been obvious to combine Oyumi '677 with Pass '402 to obtain the invention as specified in claim 1.

Oyumi '677 as modified does not expressly disclose sending each of the images of the first class to a respective one of the printing units.

Karidi '335 discloses sending each of the images of the first class to a respective one of the printing units (Fig 3, #100 and Fig. 1. i.e. The processed image in RGB or CMYK 22 may be routed to a print engine 24. The RGB or CMYK pixel are separated into classes. Column 4, lines 13-42).

Oyumi '677 and Karidi '335 are combinable because they are from same field of endeavor of image representation (Karidi '335 at "Field of Invention").

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the printer system as taught by Oyumi '677 by adding sending each of the images of the first class to a respective one of the printing units as taught by Karidi '335. The motivation for doing so would have been because it is advantageous to print the images in separate categories for easy organization. Therefore, it would have been obvious to combine Oyumi '677 with Karidi '335 to obtain the invention as specified in claim 1.

Regarding claim 2; Oyumi '677 as modified does not expressly disclose wherein the system processing unit is adapted to compare the calculated histograms by calculating cross-correlation values between the images in the print job based on the histograms.

Karidi '335 discloses wherein the system processing unit is adapted to compare the calculated histograms (Fig. 4, Compare Correlation 430) by calculating cross-correlation values (Fig. 4, Calculate Correlation Values 420) between the images in the print job based on the histograms (i.e. Fig. 4 is a flow diagram illustrating a cross correlation technique for image classification. Column 9, lines 13-67).

Oyumi '677 and Karidi '335 are combinable because they are from same field of endeavor of image systems (Karidi '335 at "Field of Invention").

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the printer system as taught by Oyumi '677 by adding wherein the system processing unit is adapted to compare the calculated histograms by calculating cross-correlation values as taught by Karidi '335. The motivation for doing so would have been because it is advantageous to be able to identify the various information formats within each page of a document. Therefore, it would have been obvious to combine Oyumi '677 with Karidi '335 to obtain the invention as specified in claim 1.

Regarding claim 3; Oyumi '677 discloses wherein the plurality of printing units includes at least a first printing unit (Fig. 1, Printer 301) and a second printing unit (Fig. 1, Printer 302);

wherein the number of classes equals the number of printing units and includes at least a first class and a second class (Fig. 10, Step S1101-S1103, i.e. S1101, each printer is instructed to print mark images according to classes such as full-color/black-and-white printing, double-sided/one-sided printing, and print speed. Column 11, lines 63-67 thru column 12, lines 1-26).C11, L51-57

and wherein the first class of images is printed on the first printing unit and the second class of images is printed on the second printing unit (Fig. 10, Step S1109 sends each of the images of a class to the respective printers. Column 6, lines 40-43).

Regarding claim 4; Karidi '335 discloses wherein the cross-correlation values between the images in the print job are normalized and have a value of one of 0, 1, and between 0 and 1, wherein the value is 0 when the images are most dissimilar and is 1

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when the images are most similar (Table 1, i.e. Table 1 show the correlation values at 0 & 1. Columns 5 & 6).

Regarding claim 5; Karidi '335 discloses wherein the histogram for each image includes a multitude of bins each representing colors, and wherein calculating the cross-correlation values includes calculating a normalized summation of the product of each color bin for the multitude of bins (i.e. Cross Correlation. i.e. Column 8, lines 31-64).

Regarding claim 6; Karidi '335 discloses wherein the system processing unit is adapted to classify the images based on the comparison of the calculated histograms by forming a group for each of the images in the print job, and then adding other images to the group as image members of the group when the cross-correlation value between respective images is greater than a threshold value (Fig. 4, #'s 430 & 440. Column 9, lines 31-35).

Regarding claim 7; Karidi '335 discloses wherein the threshold value is between approximately 0.8 and approximately 0.95 (i.e. The predetermined threshold is typically 0.6-0.7. Column 3, lines 32-34).

Regarding claim 8; Karidi '335 discloses wherein the system processing unit is adapted to classify the images based on the comparison of the calculated histograms by also forming subgroups from the groups by regrouping groups that have image members in common (Fig. 3 Steps 100-120, Column 4, lines 39-67).

Regarding claim 9; Karidi '335 discloses wherein the system processing unit is adapted to merge groups that have at least half of the image members in common into subgroups (Fig. 3 Steps 100-120, Column 4, lines 39-67).

Regarding claim 10; Karidi '335 discloses wherein the system processing unit is adapted to regroup image members from groups having less than half of the image members in common into subgroups by computing an average cross-correlation value of each image member of the groups with each group to determine the group to which the image member belongs (Fig. 3 Steps 100-120, Column 4, lines 39-67).

Regarding claim 11; Karidi '335 discloses wherein the system processing unit is adapted to classify the images based on the comparison of the calculated histograms by also forming sets from the subgroups by merging subgroups that have similar image members (Fig. 3 Steps 100-120, Column 4, lines 39-67).

Regarding claim 12; Karidi '335 discloses wherein the system processing unit is adapted to classify the images based on the comparison of the calculated histograms by also forming core classes from the sets by selecting the sets with the greatest number of image members as the core classes (Fig. 3 Steps 100-120, Column 4, lines 39-67).

Regarding claim 13; Oyumi '677 discloses wherein the number of core classes is equal to the number of printing units in the system (Fig. 10, Step S1101 – S1103 wherein the number of classes equals the number of printing units. See also column 11, lines 63-67 thru column 12, lines 1-26).

Regarding claim 16; Oyumi '677 discloses wherein the printing units are each individual printers operatively coupled to the system processing unit (Fig. 1, Printers 301 and 302. i.e The host server 303 communicates with the printers 301 and 302 via the network 40, controls the operation of the printers 301 and 302, distributes images to the printers 301 and 302, and performs image processing. Column 6, lines 40-43).

Regarding claim 17; Oyumi '677 discloses wherein the printing units are each print engines contained in a single printer (Fig. 2, Motor - Not Shown. i.e. The photosensitive body 1 is rotated in the direction of an arrow A by a motor, not shown. Column 6, lines 48-54).

Regarding claim 18; Oyumi '677 discloses wherein the printing units are each printheads contained in a single printer (Fig. 2, Developing Unit 13 i.e. The developing devices develop latent images on the photosensitive body 1. Column 6, lines 57-67).

Regarding claim 14; Karidi '335 discloses wherein the system processing unit is adapted to classify the images based on the comparison of the calculated histograms by also forming final classes from the core classes by adding any remaining image members of the sets to the core classes with which the sets are most similar (Fig. 3 Steps 100-120, Column 4, lines 39-67).

Regarding claim 15; Karidi '335 discloses wherein the system processing unit is adapted to determine which sets are most similar to which of the core classes by a progressive process wherein the number of image members in a core class increases each time a set is merged into one of the core classes (Fig. 3 Steps 100-120, Column 4, lines 39-67).

Regarding claim 19 & 29; Claim 19 & 29 contains substantially the same subject matter as claim 1. Therefore, claim 19 & 29 are rejected on the same grounds as claim 1.

Regarding claim 20 & 30; Claims 20 & 30 contains substantially the same subject matter as claim 2. Therefore, claim 20 & 30 are rejected on the same grounds as claim 2.

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Regarding claim 21 & 32; Claims 21 & 32 contains substantially the same subject matter as claim 5. Therefore, claim 21 & 32 are rejected on the same grounds as claim 5.

Regarding claim 22 & 33; Claims 22 & 33 contains substantially the same subject matter as claim 6. Therefore, claims 22 & 33 are rejected on the same grounds as claim 6.

Regarding claim 23 & 34; Claims 23 & 34 contains substantially the same subject matter as claim 8. Therefore, claim 23 & 34 are rejected on the same grounds as claim 8.

Regarding claim 24 & 35; Claims 24 & 35 contains substantially the same subject matter as claim 9. Therefore, claims 24 & 35 are rejected on the same grounds as claim 9.

Regarding claim 25 & 36; Claims 25 & 36 contains substantially the same subject matter as claim 5. Therefore, claims 25 & 36 are rejected on the same grounds as claim 10.

Regarding claim 26 & 37; Claims 26 & 37 contains substantially the same subject matter as claim 11. Therefore, claims 26 & 37 are rejected on the same grounds as claim 11.

Regarding claim 27 & 38; Claims 27 & 38 contains substantially the same subject matter as claim 12. Therefore, claims 27 & 38 are rejected on the same grounds as claim 12.

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Regarding claims 28 & 39; Claims 28 & 39 contains substantially the same subject matter as claim 14. Therefore, claims 28 & 39 are rejected on the same grounds as claim 14.

Regarding claim 31; Claim 31 contains substantially similar features as that of apparatus claim 3. Thus, claim 31 is rejected on the same ground as claim 3.

Examiner Notes

6. The Examiner cites particular columns and line numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully considers the references in its entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or as disclosed by the Examiner.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARCUS T. RILEY whose telephone number is (571)270-1581. The examiner can normally be reached on Monday - Friday, 7:30-5:00, est.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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